M-LEARNING APPLICATION FOR COMPUTER NETWORKING SUBJECTS

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ABSTRACT

Nowadays, mobile application, called mobile learning, is widely used among academic staff to help them in the process of teaching and learning at university. This research proposed the use of mobile learning in computer network subjects, particularly computer network and security, to facilitate the ease of access to the source of material and evaluation. Based on the questionnaire that distributed to the students, 75% respondents found this application is easy to use, attractive, and helping them to understand the content of subjects.

KEY WORDS

Mobile learning, teaching media, networking subjects

1. Introduction

University has a responsibility to conduct high-quality education processes. In that case, there are two critical components involved, which are the method of teaching and the media to be used. To increase the level of understanding of the student about the contents, it is essential to be able to choose appropriate learning media.

Computer network and security are the subjects that essential to be understood properly by the students of the computer program. These subjects, for practical and theory, do cover large area of topics and some of them need to be interpreted in multimedia rather than text only. Hence, it is important to have the media that easy to distribute and to access them.

Nowadays, the use of information technology as a learning media is remarkable. One of the technologies is the smartphone that now widely used to deliver materials to the students. This kind of delivery also known as mobile learning or M-Learning. M-Learning is a learning medium that utilizes mobile technologies such as tablets, smartphones, and other devices as an interface to access the material, do the test, and evaluate the work.

The rest of this paper is organized as follow. The second part is used to provide information the use of mobile learning in various subjects in university, the third discusses the proposed system, the fourth part shows the results and discuss them, and the last is conclusion.

2. Mobile Learning in Education

Mobile learning application is widely used in education system due to the supports to 24 hours' access to the teaching resources everywhere. In 2008, Cavus and Uzunboylu [1] published their paper about the use M-Learning on environmental studying student. In 2009, Waycor and Kennedy proposed the implementation of M-Learning to help student to learn chemistry in daily live [2]. In 2012, Alshabi and Elleithy used M-Learning as a substitute media to teach computer and engineering [3]

The use of M-learning can be added with additional virtual laboratory called mobile laboratory [4]. This feature helps students to do simulation, exercise, and get feedback from their works.

3. Proposed System

The proposed system is running on Android platform because this platform supports the easy development and distribution the applications [5].

The lecturers, in this case, will upload the materials, tasks, and quiz to the server and save them to the database. The students use their smartphone that equipped with mobile data to access the m-learning application. The architecture of the system is shown below.

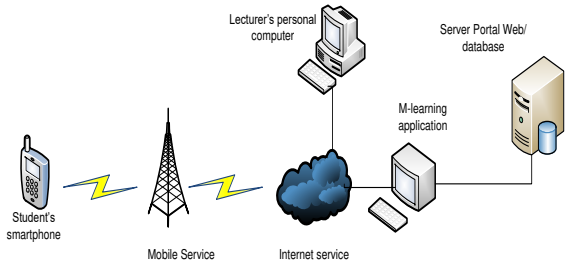


Fig 2. Architecture System

The flow how the students access the application is described below.

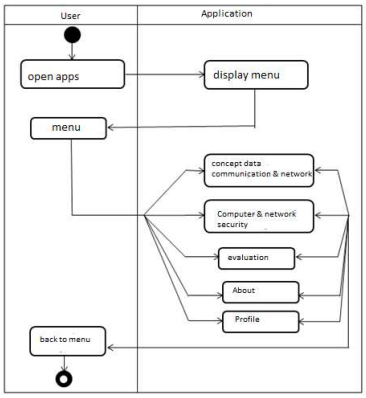
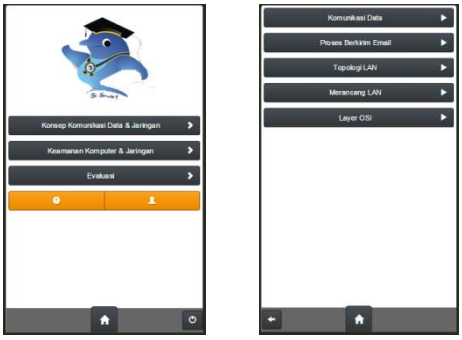


Fig. 3 The Flow of Access to The Application

The students, or user, opens the application or apps, the apps, trigering by this acction, displays the menu.There are 5 menus available, which are concept data communication and network, computer and network security, evaluation, about, and profile.

4. Result and Discussion

4.1 M-learning for Networking Subjects



(4a) **(4b)**

Fig. 4a The Main Menu of Content of Concept of Data Communcation and Network
Fig. 4b The Sub Menu of Content of Concept of Data Communcation and Network

The materials in this app are dominated by the animation based video. This is intended to help the student to understand how some protocols work and implemented. The videos are designed to provide detail information, step-by-step, for instance, how the data is transferred from computer to other media (fig.5) and how to establish secure authentication to protect the data by performing digital signature (fig.6).

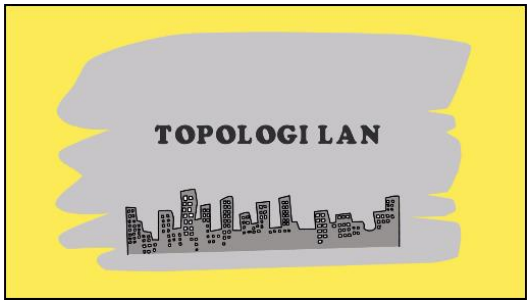


Fig. 5 The Material of Topologi LAN

Fig. 6 The Material of Digital Signature

The apps also equipped by the evaluation menu to check whether the students understanding the materials that

have been discussed (fig.7). The lecturers can simply add the questions by log in onto the server.

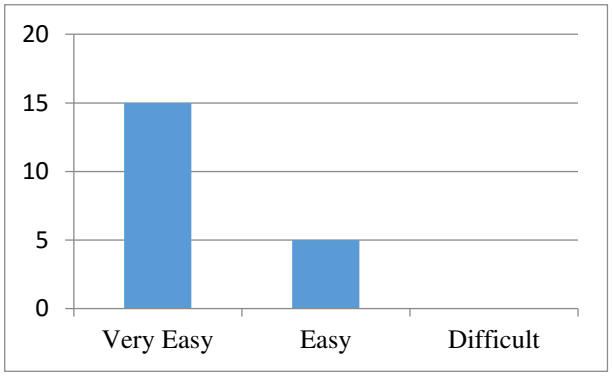
Fig. 7 The Menu of Evaluation

This application has been tested in different mobile phone to evaluate its compatibility. Table below shows the various devices and their specification used in the test as well as the result.

Table 1 Hadrware Test

No	Hardware	Result
1.	Xiaomi Mi4i. Specification : 5.0 (Lolipop), Layar 5 inci, RAM 2 GB	The video contents are running well.
2.	Lenovo S930. 4.2 (Jelly Bean), Layar 6. inci, RAM 1 GB	The video contents are running well.
3.	Samsung Galaxy Grand. 4.2 (Jelly Bean), Layar 5 inci, RAM 1 GB	The video contents are running well.
4.	Xiaomi Redmi Note 3. 5.1 (Lollipop), Layar 5.5 inci, RAM 3 GB	The video contents are running well.

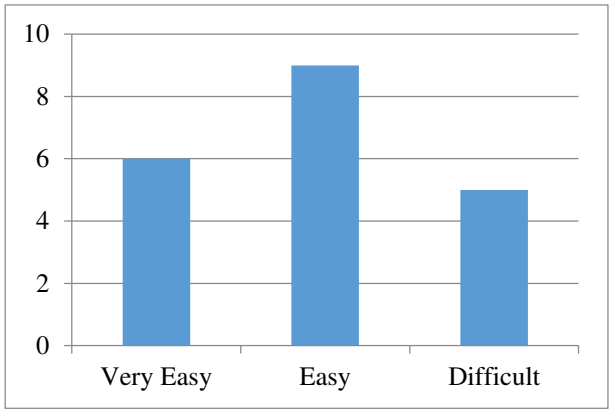
This application has been tested by 20 students as well to evaluate the ease of the use, whether the contents are easy to be understood, and help to in the learning process. The graph 1 shows that 15 students consider this application is very easy to operate, 5 students claim this is easy, and none of them consider this application is difficult.



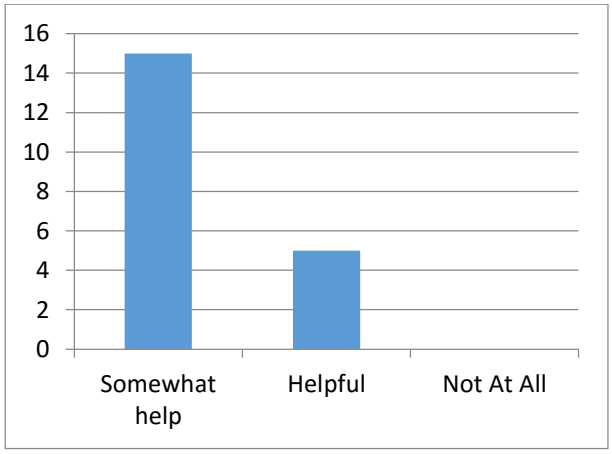
Graph1. Respond For the Ease of the Use

Graph 2 illustrates the difference between the students who choose to answer that the materials is easy to understood is only slightly different, five and six respectfully, while nine students consider easy.

The respond for the last question is reflected at graph 3. This graph tells that 15 students claim this application somewhat help the student to understand the material, thus it help them to learn the material better. The rest of students claim this is helpful.



Graph 2 the Respond for the Ease of Materials



Graph 3 the Respond for the Useful of Application

5. Conclusion

In conclusion, to help the teaching and learning process met its goals, the use of right media is compulsory. This research has successfully developed an application called mobile learning to help the student of computer program

to learn networking subjects. The application has been tested in two different ways, the hardware and the software. The result shown that this application is able to run in various of smartphone and help the students to understand the subjects easily.

Acknowledgement(s)

This research is funded by Directorate Higher Education under research PEKERTI Grant.

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